2022

Electronic Health (e-health) Literacy among Undergraduate University Students

Kalsoom Akhtar
Department of Tourism and Hospitality Management, Institute of Business Management and Administrative sciences, The Islamia University of Bahawalpur, Pakistan, kalsoom.akhtar@iub.edu.pk

Shazia Yusuf Dr
Department of Professional Psychology, Bahria University Islamabad., shazia_yusuf@yahoo.com

Samar Fahd Dr
Department of Applied psychology, The Islamia University of Bahawalpur, Pakistan

Imran Ajmal
PhD scholar, Department of Applied psychology, the Islamia University of Bahawalpur, Pakistan

Electronic Health (e-health) Literacy among Undergraduate University Students
Kalsoom Akhtar, Shazia Akhtar, *Samar Fahd, Imran Ajmal

Kalsoom Akhtar
Department of Tourism and Hospitality Management,
Institute of Business Management and Administrative sciences
The Islamia University of Bahawalpur, Pakistan
kalsoom.akhtar@iub.edu.pk

Dr Shazia Yusuf,
Department of Professional Psychology, Bahria University Islamabad.
shazia_yusuf@yahoo.com

*Dr Samar Fahd,
Department of Applied psychology, The Islamia University of Bahawalpur, Pakistan.

Imran Ajmal,
PhD scholar, Department of Applied psychology, the Islamia University of Bahawalpur, Pakistan

Abstract:

E-health literacy refers to the knowledge of electronic resources and searching techniques that are required to obtain credible health information. E-health literacy can help the general population to search, acquire, appraise, use and interpret health-related information from electronic sources, as well as to be able to apply the gained information to address and solve health-related problems.

A large scale cross-sectional survey was conducted to appraise the e-health literacy skills among undergraduate psychology students. The population of the study comprised of undergraduate psychology students enrolled in the public sector universities. A questionnaire was developed by conducting a thorough review of the relevant literature on e-health literacy and assessing the electronic health information seeking behaviour in the participating universities.

The collected data was analysed using Statistical Package for Social Sciences (SPSS-23) and presented in descriptive and inferential statistics.

The findings of the study concluded that majority of the respondents had moderate level of e-health literacy skills. The study recommended that the information professionals in the participating universities should play their effective role in promoting the e-health literacy among undergraduate psychology students through offering a structured program, having 02 credit hours, on e-health literacy skills.

Keywords: e-health literacy, internet, electronic information resources, undergraduate students.

Introduction

E-health literacy, also known as Digital Health Literacy (DHL), is defined as the use of the internet to obtain health-related information for the purpose of resolving health problems and issues (Bittlingmayer *et al*., 2020). E-health (electronic health) plays a critical role in the self-management of people with chronic conditions. According to the literature, 80 percent of people with chronic conditions take care of themselves at home or with the support of friends, family members, or relatives (Efthymiou *et al*., 2017). However, collecting the proper information from credible sources is critical for disease self-management, highlighting the necessity of public e-health literacy. As a result, e-health literacy is critical for improving an individual's health care quality and outcome (Lundy and Janes, 2009).

Health literacy is largely associated with the concept of health promotion (Nutbeam, 2000). The public's health literacy level indicates whether people have access to fundamental health information resources and services, and whether they are able to seek, appraise, use, and interpret these resources in order to make informed health decisions (Lambert M et al., 2014; Berkman et al., 2010). Electronic resources are critical for facilitating the dissemination of health-related information. The utilisation of electronic resources and the rapid rise of

information communication technologies in the health sector are expanding day-by-day (Richtering, *et al.,* 2017). As a result, electronic health (e-health) provides a channel of electronic instruments via which the general public can quickly search for health-related information (Robert Bautista, 2015).

According to the US Department of Health and Human Services, e-health literacy can improve health care safety, improve health care decision-making skills, and establish health skills and knowledge of health-related information (Austin, 2012). E-health literacy can help people manage their health conditions more effectively by boosting and causing positive improvements in their health behaviour and decision-making skills (Xie, 2011; Xie and Bugg, 2009; Brown and Dickson, 2010).

Traditional health services, such as emergency consultations, clinical consultations, and consultations for various medical services, are quickly being replaced by digital health services in European countries. However, due to the presence of numerous obstacles and issues, this burgeoning concept is still fresh to developing countries. According to the Pew Internet and American Life Project, the global population is growing at a rate of 1.4 percent per year, while information communication technology users are increasing at a rate of 7.9 percent. As a result, the internet and social media platforms have become a valuable source of health information (Asad *et al*, 2017).

Adoption of electronic health records and access to health information via the internet or social media sites does not imply that technology has been correctly used or that patients have had access to high-quality, trustworthy data (Bodie & Dutta, 2008). Computer and health illiteracies promote e-health literacy, which is constantly centred on the ability to find, interpret, assess, and appraise credible health information using information communication technology

(Norman & Skinner, 2006). People with a low level of e-health literacy are less likely to believe that the internet is a useful tool for health information, to trust health information obtained from various channels and sources, and to dynamically seek health information from the internet (Paige *et al*., 2017; Neter & Brainin, 2012).

Because social media has the strongest position among the key communication channels for information transmission and serves as a more important source of health information than traditional news media, it is an important source of health information (Perrin, 2015). However, the self-contained character of social media, in which everyone has become a producer, poses a severe dilemma in terms of the quality and accuracy of health-related information sharing. Educators, research scientists, and observers looking closely at e-health become more media literate, enabling them to combat misleading information and dubious sources and information, one of the major concerns of infodemic, disinformation, and misinformation on social media (Vraga & Tully, 2019). This demonstrates the necessity of e-health literacy in seeking, finding, understanding, and evaluating credible health-related information from authentic electronic sources or resources, as well as avoiding misleading leading health information, in order to better resolve health concerns.

Pakistan is a developing country, and having a high degree of e-health literacy is critical for a low-income country like Pakistan. According to the World Bank, the notion of e-health literacy and e-health services is critical for nations facing financial challenges (Chetley *et al*., 2006), and can be extremely beneficial in archiving the Millennium Development Goals (MGD) (Aldahmash *et al*., 2019; Tennant *et al*., 2015). E-health literacy and the development of digital health care settings can also help to lower health-care budget expenses and act as a cost-effective

option for countries like Pakistan who are facing escalating health-care issues (St. Jean *et al.*, 2017).

The use of the internet and social media technologies for health-related information is posing a number of issues in both developed and developing countries. Various empirical studies in developed countries revealed a number of major barriers to e-health literacy adoption, including limited access to the internet and supporting devices, a lack of understanding of how to use Android devices, a lack of training in how to use modern devices, and a lack of education and digital skills (Griffiths *et al.,* 2015; Smith & Magnani, 2019).

Inadequate literacy, power crises, rural public, low internet connection, and the digital divide between rich and poor are all important difficulties in the adoption of e-health literacy in Pakistan (Asad *et al.*, 2017; Tatara *et al.,* 2019; Tatara *et al.,* 2019). In Pakistan, the majority of the population (72%) lives in villages, while the remaining 28 percent lives in cities, especially the elderly, who are less familiar with how to use digital technology to obtain health information (Farrer *et al.*, 2020).

Keeping in view the above scenario, the present study is conducted to assess the e-health literacy level of undergraduate psychology students at public sector universities.

Methodology

A cross-sectional survey was conducted to collect the data for this study. The population of the study comprised of undergraduate psychology students enrolled in the public sector universities of Pakistan. A questionnaire was developed by conducting a thorough review of the relevant literature on e-health literacy and assessing the electronic health information seeking behaviour in the participating universities. The first part of the questionnaire comprised of demographic information of the respondents such as gender, age, semester, type of university, and setting. The second part of the questionnaire contained questions on e-health literacy skills.

A set of 10 statements was used to determine the e-health literacy skills of the undergraduate psychology students. A five point Likert type scale from strongly agree to strongly disagree was used to record the responses of the respondents in the questionnaire. A questionnaire was pre tested by three experts in the field of information management and psychology. The proposed suggestions were incorporated in the questionnaire. The questionnaire was pilot tested on first 10 responses.

A convenience sampling technique, a non-probability sampling approach, was used to collect the data from the respondents. A 1500 copies of questionnaire were distributed among the participants. Of which 1156 copies were received back after three follow-up with a gap of one week. The response rate of the study was 77%. The collected data was entered in Statistical Package of Social Sciences (SPSS-v-23). The data was cleaned for missing or incorrect values. The data was analysed and presented using mean, standard deviation. For inferential statistics, first the assumptions were checked. The data did not assume the normal distribution. Therefore, Mann Whitney-U statistics were used to determine the difference between male and female respondents and their e-health information literacy skills.

Results

Of the 1156 (100%) respondents, majority 868 (75.1%) were male and 288 (24.9%) were female. Most 392 (33.9%) of the respondents' age was 21 years, and 230 (19.9%) respondents were 20 years old and 256 (22.1%) were 19 years old. A statistically significant difference was found in the distribution of male and female respondents in different age groups (p=<.05) and the strength of this difference was a small (Cramer's v .275) (Table 1).

Most 443 (38.3%) respondents were enrolled in the 5th semester, and 288 (24.9%) respondents were enrolled in 4th semester. There were only 12 (1%) respondents from 2nd semester who participated in the study. A statistical significant difference was found in the distribution of male and female respondents in different semesters (p=<.05) and the strength of this difference was a moderate (Cramer's v .301) (Table 1). Majority 950 (82.2%) of the respondents were from public sector universities and 206 (17.8%) respondents were studying in private sector universities. The majority 716 (61.9%) of the respondents belong to rural settings, while 440 (38.1%) were from urban settings. A statistical significant difference was found in the distribution of male and female respondents in public and private sector universities, and urban and rural settings they belong to (p=<.05) (Table 1).

Table 1. Demographic Information of the Respondents

	Male	Female	x^2	P-value	Phi	Cramer's V
Respondents' Age						
18 years	22 (64.7%)	12 (35.3%)	87.239[a]	.000		.275
19 years	163 (63.7%)	93 (36.3%)				
20 years	184 (80.0%)	46 (20.0%)				
21 years	335 (85.5%)	57 (14.5%)				
22 years	71(85.5%)	12 (14.5%)				
23 years	82(54.7%)	68 (45.3%)				
24 years	11 (100%)	0 (0%)				
Semester						
1st	33 42.9%	44 57.1%	105.024	.000		.301
2nd	0 (0.0%)	12 (100.0%)				
3rd	91 (72.8%)	34 (27.2%)				
4th	244 (84.7%)	44 (15.3%)				
5th	335 (75.6%)	108 (24.4%)				
6th	11 100.0%	0 (0.0%)				
7th	131 (74.0%)	46 (26.0%)				
8th	23 (100.0%)	0 (0.0%)				
Type of University						
Public	696 (73.3%)	254 (26.7%)	9.475	.001	-.091	

Private	172 (83.5%)				
		34 (16.5%)			
Setting					
Rural	562 (78.5%)	154 (21.5%)	11.660	.000	.100
Urban	306 (69.5%)	134 (30.5%)			

Respondents were asked a set of 10 statements in order to determine their e-health literacy skills. All of these statements received a mean score around 3, indicating that majority of respondents found slightly agree with these statements, such as; "I know how to find helpful health resources on the Internet" *(Mean 3.44, SD = 1.152),* "I have the skills I need to evaluate the health resources I find on the Internet" *(Mean 3.40, SD = 1.093),* "I know what health resources are available on the Internet" *(Mean 3.39, SD = 1.143)",* "I know where to find helpful health resources on the Internet" *(Mean 3.36, SD = 1.132),* "I know how to use the Internet to answer my questions about health" *(Mean 3.35, SD = 1.148),* "I know the importance to access health resources/ information on internet" *(Mean 3.33, SD = 1.204),* "I know how to use the health information, I find on the Internet to help me" *(Mean 3.30, SD = 1.30) (Table 2)*

Table 2. E-health literacy among undergraduate psychology students

Rank	Statements	N	Mean	Std. Deviation
1	"I know how to find helpful health resources on the Internet"	1156	3.44	1.152
2	"I have the skills I need to evaluate the health resources I find on the Internet"	1156	3.40	1.093
3	"I know what health resources are available on the Internet"	1156	3.39	1.143
4	"I know where to find helpful health resources on the Internet"	1156	3.36	1.132
5	"I know how to use the Internet to answer my questions about health"	1156	3.35	1.148
6	"I know the importance to access health resources/ information on internet"	1156	3.33	1.204

7	"I know how to use the health information, I find on the Internet to help me"	1156	3.30	1.130
8	"I feel confident in using information from the Internet to make health decisions"	1156	3.28	1.187
9	"I know that internet is helping me, in making decision about my health"	1156	3.23	1.336
10	"I can tell high quality health resources from low quality health resources on the Internet"	1156	3.20	1.201

Scale: 5=Strongly Agree, 4=Agree, 3=Slightly Agree, 2= Disagree, 1= Strongly Disagree

In order to determine the difference in the e-health literacy skills between male and female respondents, we found that the data was not normally distributed (Table 3). Using Kolmogorov-smirnov and Shapiro-Wilk statistics we found a statistically significant difference in the distribution of the male and female respondents in all the 10 statements as p-value of all these statements was less than the alpha value (0.05) (Table 3).

Table 3. Tests for Normality

<table>
<tr><td colspan="8" align="center">Tests of Normality</td></tr>
<tr><td></td><td></td><td colspan="3">Kolmogorov-Smirnov[a]</td><td colspan="3">Shapiro-Wilk</td></tr>
<tr><td></td><td>Gender</td><td>Statistic</td><td>Df</td><td>Sig.</td><td>Statistic</td><td>df</td><td>Sig.</td></tr>
<tr><td>"I know that internet is helping me, in making decision about my health"</td><td>Male</td><td>.146</td><td>868</td><td>.000</td><td>.893</td><td>868</td><td>.000</td></tr>
<tr><td></td><td>Female</td><td>.219</td><td>288</td><td>.000</td><td>.855</td><td>288</td><td>.000</td></tr>
<tr><td>"I know the importance to access health resources/ information on internet"</td><td>Male</td><td>.211</td><td>868</td><td>.000</td><td>.905</td><td>868</td><td>.000</td></tr>
<tr><td></td><td>Female</td><td>.223</td><td>288</td><td>.000</td><td>.841</td><td>288</td><td>.000</td></tr>
<tr><td>"I know what health resources are available on the Internet"</td><td>Male</td><td>.269</td><td>868</td><td>.000</td><td>.863</td><td>868</td><td>.000</td></tr>
<tr><td></td><td>Female</td><td>.245</td><td>288</td><td>.000</td><td>.848</td><td>288</td><td>.000</td></tr>
<tr><td>"I know where to find helpful health resources on the Internet"</td><td>Male</td><td>.194</td><td>868</td><td>.000</td><td>.903</td><td>868</td><td>.000</td></tr>
<tr><td></td><td>Female</td><td>.223</td><td>288</td><td>.000</td><td>.889</td><td>288</td><td>.000</td></tr>
<tr><td>"I know how to find helpful health resources on the Internet"</td><td>Male</td><td>.279</td><td>868</td><td>.000</td><td>.871</td><td>868</td><td>.000</td></tr>
<tr><td></td><td>Female</td><td>.230</td><td>288</td><td>.000</td><td>.862</td><td>288</td><td>.000</td></tr>
<tr><td>"I know how to use the Internet to answer my questions about health"</td><td>Male</td><td>.199</td><td>868</td><td>.000</td><td>.895</td><td>868</td><td>.000</td></tr>
<tr><td></td><td>Female</td><td>.266</td><td>288</td><td>.000</td><td>.851</td><td>288</td><td>.000</td></tr>
<tr><td>"I know how to use the health information, I find on the Internet to help me"</td><td>Male</td><td>.250</td><td>868</td><td>.000</td><td>.892</td><td>868</td><td>.000</td></tr>
<tr><td></td><td>Female</td><td>.232</td><td>288</td><td>.000</td><td>.851</td><td>288</td><td>.000</td></tr>
<tr><td>"I have the skills I need to evaluate the health resources I find on the Internet"</td><td>Male</td><td>.232</td><td>868</td><td>.000</td><td>.899</td><td>868</td><td>.000</td></tr>
<tr><td></td><td>Female</td><td>.265</td><td>288</td><td>.000</td><td>.831</td><td>288</td><td>.000</td></tr>
</table>

"I can tell high quality health resources from low quality	Male	.171	868	.000	.908	868	.000
health resources on the Internet"	Female	.198	288	.000	.906	288	.000
"I feel confident in using information from the Internet to	Male	.180	868	.000	.908	868	.000
make health decisions"	Female	.157	288	.000	.914	288	.000

a. Lilliefors Significance Correction

A Mann Whitney U statistics were used to determine a difference if any in the e-health literacy skills between male and female respondents. A statistically significant difference was found in the statements "I know the importance to access health resources/information on internet" *(MR= 566.97 vs 613.26 , U= 114980.500 , p = .036),* "I know what health resources are available on the Internet" *(MR= 605.41 vs 497.41 , U= 101638.000 , p = .000),* "I know where to find helpful health resources on the Internet" *(MR= 596.76 vs 523.46 , U= 109141.000 , p = .00),* "I know how to find helpful health resources on the Internet" *(MR= 606.73 vs 493.41, U= 100487.500 , p = .000),* "I know how to use the Internet to answer my questions about health" *(MR= 600.04 vs 513.58, U= 106294.000 , p = .000),* "I can tell high quality health resources from low quality health resources on the Internet" *(MR= 587.78 vs 550.54 , U= 158555.500 , p = .091),* and "I feel confident in using information from the Internet to make health decisions" *(MR= 595.54 vs 527.14 , U= 110200.000, p = .002)* (Table 4). However, no significant difference found in the statement such as "I know that Internet is helping me in making decisions about my health" *(MR= 574.77 vs 589.73 , U= 121758.000 , p = .499),* "I know how to use the health information, I find on the Internet to help me" *(MR= 584.28 vs 561.09 , U= 119976.500 , p = .286),* and "I have the skills I need to evaluate the health resources I find on the Internet" *(MR= 583.46 vs 563.54 , U= 120683.500 , p = .359)* (Table 4).

Table 4. E-literacy skills between male and female respondents

	Gender	N	Mean Rank	Mann-Whitney U	Wilcoxon W	Z	P-value
"I know that internet is helping me, in making decision about my health"	Male	868	574.77				
	Female	288	589.73	121758.000	498904.000	-.676	.499
	Total	1156					
"I know the importance to access health resources/ information on internet"	Male	868	566.97				
	Female	288	613.26	114980.500	492126.500	-2.102	.036
	Total	1156					
"I know what health resources are available on the Internet"	Male	868	605.41	101638.000	143254.000	-5.018	.000
	Female	288	497.41				
	Total	1156					
"I know where to find helpful health resources on the Internet"	Male	868	596.76				
	Female	288	523.46	109141.000	150757.000	-3.350	.001
	Total	1156					
"I know how to find helpful health resources on the Internet"	Male	868	606.73				
	Female	288	493.41	100487.500	142103.500	-5.230	.000
	Total	1156					
"I know how to use the Internet to answer my questions about health"	Male	868	600.04				
	Female	288	513.58				
	Total	1156		106294.000	147910.000	-3.962	.000
"I know how to use the health information, I find on the Internet to help me"	Male	868	584.28				
	Female	288	561.09	119976.500	161592.500	-1.067	.286
	Total	1156					
"I have the skills I need to evaluate the health resources I find on the Internet"	Male	868	583.46				
	Female	288	563.54	120683.500	162299.500	-.918	.359
	Total	1156					
"I can tell high quality health resources from low quality health resources on the Internet"	Male	868	587.78				
	Female	288	550.54	116939.500	158555.500	-1.692	.091
	Total	1156					
"I feel confident in using information from the Internet to make health decisions"	Male	868	595.54	110200.000	151816.000	-3.101	.002
	Female	288	527.14				
	Total	1156					

Discussion

The findings of the study showed that the majority of the respondents were somewhat aware of the type of health resources available on the Internet, they were slightly able to find helpful health resources on the Internet and they had the moderate level of skills to evaluate these health information resources.

The findings of our study is similar to the findings of other studies that found that majority of the students were slightly familiar or unfamiliar with the concept of e-health literacy, the majority had moderate level of knowledge with e-health literacy skills such as where to find helpful health information resources on the internet, how to evaluate the health information resources on the internet (Aslantekin-Özcoban & Gün, 2021; Söylemez, & Güneş, 2018; Tarihoran, *et al*., 2021). On the other hand, Golbasi, Erenel, & Tugut (2012) revealed 71 percent of students indicated that they had never heard of electronic health information resources.

Our study found that male respondents have significantly higher e-health literacy skills as compared to female respondents. The findings of our study is compatible with the findings of the studies conducted previously that concluded demographic information such as gender, age, grade and socio-economic factors play a significant role in the level of e-health literacy skills (Top & Yigitbas, 2020).

The study has some important practical implications; such as it identified the level of e-health literacy skills that is moderate among the undergraduate psychology students. Secondary, it highlights the significant role of the information professionals that they can play to improve the level of e-health literacy skills among the undergraduate psychology students. These skills can be improved through different ways; one can be launching e-health literacy programs for

undergraduate level students, in which students may be given hand-on-practice on the electronic health information resources available online, how to search, find, evaluate, store, use, and disseminate these resources. Secondary, there is need that the students may be taught with the basics of medical language, and instructions given on the drugs, and to be able to read prescriptions. There is also a need that students may be taught about how to recognize the need for e-health information, and how to fulfil the need in order to address the health related problems. Therefore, the role of information professionals in the participating universities is critical.

Conclusion:

The findings of the study concluded that the majority of the respondents had moderate level of e-health literacy skills e.g., they were slightly aware of how and where to find helpful health resources on the Internet and how to use these resources to answer the questions related to health. A significant difference found in the e-health information literacy skills between male and female respondents. Male respondents had significant higher e-health literacy skills as compared to female. The study recommended that the information professionals in the participating universities should play their effective role in promoting the e-health literacy among undergraduate psychology students through offering a structured program, having 02 credit hours, on e-health literacy skills.

References

- Aldahmash, A. M., Ahmed, Z., Qadri, F. R., Thapa, S., & AlMuammar, A. M. (2019). Implementing a connected health intervention for remote patient monitoring in Saudi Arabia and Pakistan: explaining 'the what'and 'the how'. *Globalization and health*, *15*(1), 1-7.
- Asad, N., Karmaliani, R., McFarlane, J., Bhamani, S. S., Somani, Y., Chirwa, E., & Jewkes, R. (2017). The intersection of adolescent depression and peer violence: baseline results from a randomized controlled trial of 1752 youth in Pakistan. *Child and adolescent mental health*, *22*(4), 232-241.

- Aslantekin-Özcoban, F., & Gün, M. (2021). Emergency contraception knowledge level and e-health literacy in Turkish university students. *Clinical and Experimental Obstetrics & Gynecology*, *48*(6), 1424-1431.
- Austin, R. (2012). EHealth literacy for older adults-Part I. *Ania-Caring Newsletter*, *27*(1), 7-9.
- Bautista, J. R. (2015). From solving a health problem to achieving quality of life: redefining eHealth literacy. *J Lit Technol*, *16*(2), 33-54.
- Berkman, N. D., Davis, T. C., & McCormack, L. (2010). Health literacy: what is it?. *Journal of health communication*, *15*(S2), 9-19.
- Bittlingmayer, U. H., Dadaczynski, K., Sahrai, D., van den Broucke, S., & Okan, O. (2020). Digital health literacy-conceptual contextualization, measurement, and promotion. *Bundesgesundheitsblatt, Gesundheitsforschung, Gesundheitsschutz*, *63*(2), 176-184.
- Bodie, G. D., & Dutta, M. J. (2008). Understanding health literacy for strategic health marketing: eHealth literacy, health disparities, and the digital divide. *Health marketing quarterly*, *25*(1-2), 175-203
- Brown, C. A., & Dickson, R. (2010). Healthcare students'e-literacy skills. *Journal of allied health*, *39*(3), 179-184.
- Chetley, A., Davies, J., Trude, B., McConnell, H., Ramirez, R., Shields, T., ...& Nyamai-Kisia, C. (2006). Improving health, connecting people: the role of ICTs in the health sector of developing countries-a framework paper (No. 37521, pp. 1–65). The World Bank.http://documents.worldbank.org/curated/en/234041468163474585/Improving-health-connecting-people-the-role-of-ICTs-in-the-health-sector-of-developing-countries-a-framework-paper.
- Efthymiou, A., Middleton, N., Charalambous, A., & Papastavrou, E. (2017). The association of health literacy and electronic health literacy with self-efficacy, coping, and caregiving perceptions among carers of people with dementia: research protocol for a descriptive correlational study. *JMIR research protocols*, *6*(11), e221.
- Farrer, L. M., Gulliver, A., Katruss, N., Bennett, K., Bennett, A., Ali, K., & Griffiths, K. M. (2020). Development of the Uni Virtual Clinic: an online programme for improving the mental health of university students. *British Journal of Guidance & Counselling*, *48*(3), 333-346.
- Golbasi, Z., Erenel, A. S., & Tugut, N. (2012). Knowledge and opinions of Turkish university students about contraceptive methods and emergency contraception. *Sexuality and Disability*, *30*(1), 77-87.
- Griffiths, F. E., Atherton, H., Barker, J. R., Cave, J. A., Dennick, K., Dowdall, P., ... & Sturt, J. (2015). Improving health outcomes for young people with long term conditions: the role of digital communication in current and future patient–clinician communication for NHS providers of specialist clinical services for young people–LYNC study protocol. *Digital health*, *1*, 2055207615593698.
- Lambert, M., Luke, J., Downey, B., Crengle, S., Kelaher, M., Reid, S., & Smylie, J. (2014). Health literacy: health professionals' understandings and their perceptions of barriers that Indigenous patients encounter. *BMC health services research*, *14*(1), 1-10.
- Lundy, K. S., & Janes, S. (2009). *Community health nursing: Caring for the public's health*. Jones & Bartlett Learning.

- Norman, C. D., & Skinner, H. A. (2006). eHealth literacy: essential skills for consumer health in a networked world. *Journal of medical Internet research*, *8*(2), e9.
- Neter, E., & Brainin, E. (2012). eHealth literacy: extending the digital divide to the realm of health information. *Journal of medical Internet research*, *14*(1), e19.
- Nutbeam, D. (2000). Health literacy as a public health goal: a challenge for contemporary health education and communication strategies into the 21st century. *Health promotion international*, *15*(3), 259-267.
- Paige, S. R., Krieger, J. L., & Stellefson, M. L. (2017). The influence of eHealth literacy on perceived trust in online health communication channels and sources. *Journal of health communication*, *22*(1), 53-65
- Perrin, A. (2015). Social media usage. *Pew research center*, *125*, 52-68.
- Richtering, S. S., Hyun, K., Neubeck, L., Coorey, G., Chalmers, J., Usherwood, T., ... & Redfern, J. (2017). eHealth literacy: predictors in a population with moderate-to-high cardiovascular risk. *JMIR human factors*, *4*(1), e6217.
- Smith, B., & Magnani, J. W. (2019). New technologies, new disparities: The intersection of electronic health and digital health literacy. *International journal of cardiology*, *292*, 280-282.
- Söylemez, F., & Güneş, G. (2018). Knowledge, attitude and practices of health school students in Bitlis Eren University about the emergency contraception and the associated factors. *Medicine Science*, *7*(3), 627-633.
- St. Jean, B., Greene Taylor, N., Kodama, C., & Subramaniam, M. (2017). Assessing the digital health literacy skills of tween participants in a school-library-based after-school program. *Journal of Consumer Health on the Internet*, *21*(1), 40-61
- Tarihoran, D. E., Anggraini, D., Juliani, E., Ressa, R., & Fardan, I. (2021). Indonesian Student Nurses' E-Health Literacy Skills. *Studies in Health Technology and Informatics*, *284*, 444-446.
- Tatara, N., Hammer, H. L., Mirkovic, J., Kjøllesdal, M. K. R., & Andreassen, H. K. (2019). Associations between immigration-related user factors and eHealth activities for self-care: Case of first-generation immigrants from Pakistan in the Oslo Area, Norway. *JMIR public health and surveillance*, *5*(3), e11998.
- Tennant, B., Stellefson, M., Dodd, V., Chaney, B., Chaney, D., Paige, S., & Alber, J. (2015). eHealth literacy and Web 2.0 health information seeking behaviors among baby boomers and older adults. *Journal of medical Internet research*, *17*(3), e70
- Top, F. U., & Yigitbas, C. (2020). E-health literacy level in adolescents in terms of some descriptive characteristics. *Annals of Medical Research*, *27*(1), 0340-0347.
- Xie, B. (2011). Effects of an eHealth literacy intervention for older adults. *Journal of medical Internet research*, *13*(4), e90.
- Xie, B., & Bugg, J. M. (2009). Public library computer training for older adults to access high-quality Internet health information. *Library & information science research*, *31*(3), 155-162.